



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/517,555	12/08/2004	Yuichi Nishihara	405507-0030	3859

7590 03/16/2009
Lawrence Rosenthal
Stroock & Stroock & Lavan
180 Maiden Lane
New York, NY 10038

EXAMINER

LEBRON, JANNELLE M

ART UNIT	PAPER NUMBER
----------	--------------

2861

MAIL DATE	DELIVERY MODE
-----------	---------------

03/16/2009

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/517,555	Applicant(s) NISHIHARA, YUICHI	
	Examiner JANNELLE M. LEBRON	Art Unit 2861	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 21 January 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 December 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 01/21/2009 has been entered.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

3. Claims 1-3 are rejected under 35 U.S.C. 102(b) as being anticipated by Tsukada et al. (US 2002/0012015).

Tsukada et al. discloses the following claimed limitations:

- **Claim 1:** an expendable container [liquid container 1] capable of measuring a residual quantity of stored expendable [paragraph 0074 and Abstract], the expendable container comprising:

Art Unit: 2861

- an expendable tank [container] configured to store the expendable [ink] and has a piezoelectric sensor element [actuator 106 is used to detect the consumption condition of ink (i.e. as a sensor); paragraphs 0074 and 0087] attached thereto [as seen in figs. 1A-2; paragraph 0086], the piezoelectric sensor element having a characteristic [paragraphs 0084 and 0085; actuator 106 has a configuration and is made of materials that give it certain characteristics that would be different if made using other materials or in another way];
- a driving circuit configured to energize and de-energize the piezoelectric sensor element [with electrodes; paragraphs 0082 and 0141; it is inherent that the drive signal is outputted by a driving circuit];
- a detection signal generation circuit configured to generate a detection signal including cycle information representing a cycle of an output voltage wave of the piezoelectric element after the driving circuit energizes and de-energizes the piezoelectric sensor element [from the residual vibration; paragraphs 0099, 0100 and 0142]; and
- a control module [861; inherent that it controls all the functions of the circuit] configured to control at least one of an impedance of a de-energizing circuit through which the piezoelectric sensor element de-energizes and a de-energizing time [paragraphs 0089 and 0090; the transmission circuit controls the vibration (i.e. energizing) and therefore the amplitude (and thus the impedance) of a residual vibration (that occurs

Art Unit: 2861

when it's de-energized and depends on the magnitude of the vibration part of the actuator)], in accordance with the characteristic of the piezoelectric sensor element [paragraphs 0084 and 0085; actuator 106 has a configuration and is made of materials that give it certain characteristics that affect the way the actuator vibrates and therefore energized and de-energized] so as to be a certain level that reduces a noise element present in detecting the cycle information of the detection signal [paragraphs 0089 and 0090; the higher the amplitude of the vibration, the easier the detection (i.e. less noise)], wherein

- the cycle information is available for determining whether the residual quantity of the expendable is greater than a preset level [paragraphs 0087 and 0087; it detects whether the liquid is above or below a certain level];
 - the control module is configured to vary a property affecting an output signal of the piezoelectric sensor element [paragraphs 0089 and 0090; see explanation above].
- **Claim 2:** wherein the control module is configured to vary a de-energizing time constant of the piezoelectric sensor element [the counter electromotive force generated by the residual vibration (when de-energized) varies with the amplitude of the vibration part of the actuator; furthermore, the changing cycle of magnitude of the counter electromotive force varies with the frequency of the residual vibration remaining in the vibration part of the actuator].

Art Unit: 2861

- **Claim 3:** wherein the control module is configured to vary a de-energizing time of the piezoelectric sensor element [the counter electromotive force generated by the residual vibration (when de-energized) varies with the amplitude of the vibration part of the actuator; furthermore, the changing cycle of magnitude of the counter electromotive force varies with the frequency of the residual vibration remaining in the vibration part of the actuator].

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claim 4 is are rejected under 35 U.S.C. 103(a) as being unpatentable over Tsukada et al. (US 2002/0012015) in view of Yamamoto et al. (US Patent 4,714,935).

Tsukada et al. discloses the claimed invention as discussed above regarding claim 1 but fails to expressly disclose the following claimed limitations:

- **Claim 4:** wherein the detection signal generation circuit comprises:
 - a voltage generation circuit configured to generate a predetermined potential difference between a first terminal with a higher potential and a second terminal with a lower potential;
 - the piezoelectric sensor element having one end connected to the second terminal;

Art Unit: 2861

- an energization control switch connected between the first terminal and the other end of the piezoelectric sensor element, and configured to control on and off charging from the first terminal to the piezoelectric element according to a control output from the control module;
- a de-energization control switch connected between the other end of the piezoelectric sensor element and the second terminal and configured to control on and off de-energization from the piezoelectric sensor element to the second terminal according to the control output from the control module; and
- a resistive circuit connected between the other end of the piezoelectric sensor element and the second terminal, and having a variable resistance, wherein
- the control module is configured to control the on-off of the energization control switch, the on-off of the de-energizing control switch, and the resistance of the resistive circuit.

Yamamoto et al. discloses the following claimed limitations:

- **Claim 4:** wherein the detection signal generation circuit comprises:
 - a voltage generation circuit configured to generate a predetermined potential difference between a first terminal with a higher potential and a second terminal with a lower potential [positive and negative electrodes; col. 7, lines 21-35; as seen in fig. 7];

Art Unit: 2861

- the piezoelectric element having one end connected to the second terminal [connected to ground];
- an energization control switch [37 in fig. 7] connected between the first terminal and the other end of the piezoelectric sensor element, and configured to control on and off energizing from the first terminal to the piezoelectric element according to a control output from the control module;
- a de-energization control switch [35 in fig. 7] connected between the other end of the piezoelectric element and the second terminal and configured to control on and off de-energization from the piezoelectric element to the second terminal according to the control output from the control module [col. 7, line 21 through col. 8, line 6]; and
- a resistive circuit connected between the other end of the piezoelectric sensor element and the second terminal, and having a variable resistance [40 in fig. 7], wherein
- the control module [fig. 9] is configured to control the on-off of the energization control switch, the on-off of the de-energizing control switch, and the resistance of the resistive circuit [inherent; Abstract].

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the control unit in the Tsukada invention to include a circuit that comprises a voltage source that causes a potential difference between first

Art Unit: 2861

and second terminals, the piezoelectric having one end connected to the second terminal, an energize/de-energize control switch and a resistive circuit connected between the other end of the piezoelectric element and the second terminal having a variable resistance as taught by Yamamoto et al. for the purpose of controlling the charging and discharging of the piezoelectric element and thus obtain improved results.

Response to Arguments

6. Applicant's arguments with respect to claims 1-4 have been considered but are moot in view of the new ground(s) of rejection. Please note that Tsukada et al. discloses a piezoelectric sensor element having a characteristic [paragraphs 0084 and 0085; actuator 106 has a configuration and is made of materials that give it certain characteristics that would be different if made using other materials or in another way].

7. Also, in response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., a sufficient S/N ratio) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

8. Additionally, in response to applicant's argument that Tsukada and Yamamoto are not properly combined, the test for obviousness is not whether the features of a secondary reference may be bodily incorporated into the structure of the primary reference; nor is it that the claimed invention must be expressly suggested in any one or

Art Unit: 2861

all of the references. Rather, the test is what the combined teachings of the references would have suggested to those of ordinary skill in the art. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981). Also, in response to applicant's arguments against the references individually (i.e. Yamamoto using the piezoelectric element to eject ink and not to detect the presence or absence of ink), one cannot show nonobviousness by attacking references individually where the rejections are based on combinations of references. See *In re Keller*, 642 F.2d 413, 208 USPQ 871 (CCPA 1981); *In re Merck & Co.*, 800 F.2d 1091, 231 USPQ 375 (Fed. Cir. 1986).

Communication with the USPTO

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JANNELLE M. LEBRON whose telephone number is (571)272-2729. The examiner can normally be reached on Monday thru Friday 8:30am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Matthew Luu can be reached on (571) 272-7663. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only.

Art Unit: 2861

For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jannelle M. Lebron/
Examiner, Art Unit 2861

/Lamson D Nguyen/
Primary Examiner, Art Unit 2861

03/11/2009